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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,307	12/10/2004	Hiroto Kikuchi	259431US0PCT	3909
22850 7590 10/29/2010 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER KOSAR, AARON J				
ART UNIT 1651		PAPER NUMBER		
NOTIFICATION DATE 10/29/2010		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/516,307

Applicant(s)

KIKUCHI ET AL.

Examiner

AARON J. KOSAR

Art Unit

1651

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 43-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 43-55 and 57-68 is/are rejected.
- 7) ☐ Claim(s) 56 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
Paper No(s)/Mail Date 6/12/2010.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 30, 2010 has been entered.

Response to Amendment

Applicant's amendment and argument filed August 30, 2010, are acknowledged and have been fully considered. Any rejection and/or objection of record not specifically addressed is herein withdrawn.

Applicant has amended the claims by introducing new claims 66-68. Claims 43-68 are pending and have been examined on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 44, 46, and 66-68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 44 and 46 the claims recite the term “them”; however it is unclear what object(s) the term “them” is directed and one would not be apprised as to what Applicant intends by the term. Clarification is required.

In claims 66-68, the claims recite the term “essentially odorless” is indefinite, because the specification does not define what would objectively qualify or disqualify a compound in the process as having or lacking an odor or the degree of “essentially odorless” thereof, and one would thus not be apprised as to the objective standard by which odor is determined in the process, thus rendering the determination a mere unrestrained, subjective opinion of the artisan practicing the invention. Thus the person of ordinary skill in the art would not be apprised as to what applicant intends to embrace by the claims, rendering the claims indefinite (see MPEP 2173.05(b)). Clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 43, 45, 47-55, and 57-65 are/remain rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka (AP, N’ of record) *or* Uchiyama (A, of record) *or* Tomita (N), *and* in view of Saito (V”, of record) *and* Armarego (U’, of record.) *and* NDWC (Nat’l. Drinking Water Clearinghouse (NDWC) “Organic Removal” NDWC Tech Brief, August 1997, 4 pages.) *and*

Armenante (Armenante, P.M. "Adsorption" New Jersey Institute of Technology (NJIT) <<http://cpe.njit.edu/dlnotes/CHE685/Cls11-1.pdf>> archived February 1, 2001 (accessed online October 18, 2010), 65 pages.) and USACE (U.S. Army Corps of Engineers "Engineering and Design: Adsorption Design Guide" Design Guide DG 1110-1-2, March 1, 2001, 99 pages).

A method of purifying a DFA III solution comprising contacting the solution with activated carbon particles, phase separating the solution, and recovering purified DFA III is claimed. The claims are also in general further drawn to percentages, relative quantities, and dimensions of the components.

Tanaka (AP,N') teaches the DFA product in solution (500 ml extract); less than 70% pure (0.5g DFA recoverable per 500 ml extract); the use of yeast, including fermenting with the aerobe *A. ureafaciens*; defecation (filtering boiled/sliced burdock); adsorption onto active carbon; filtering to separate the solid carbon adsorbate from the liquid filtrate; and chromatographing with HIGH-FLOW SUPERCELL (eluted with 5% ethanol) in the purification of the difructose dianhydride product (English abstract; English translation: page 4, ¶1-2; page 5 ¶1 and 3).

Uchiyama (A) teaches a process for preparing DFA III comprising obtaining DFA via a centrifuged *Arthrobacter ilicus* cell-filtrate; adjusting the filtrate concentration (from 150mL to 10mL) under reduced pressure; passing the filtrate through and further purifying the DFA III-containing fraction by an activated carbon/CELITE column, and finally concentrating to dryness

the eluted peaks to yield purified DFA III. Uchiyama also teaches that the inulin-lytic enzyme may be provided as the enzyme *per se* (an extract) or in the form of the obligate aerobic microorganism producing the enzyme (e.g. column 5, lines 4-7) and that inulin may be obtained from a variety of sources.

Tomita (N) teaches a method for purifying DFA III (Derwent- English abstract). Tomita teaches purification using centrifugation to defecate the suspended particles, and filtering by passage through activated carbon and silicates (i.e. CELITE) (Derwent- English abstract, lines 7-9). Tomita also teaches a purity of DFA III of less than 70% in that Tomita teaches a composition comprising 95% components other than inulin. Thus even 100% conversion of inulin to DFA III by the inulinase would produce a composition comprising no more than 5% DFA III. Tomita also teaches action of a fructosyltransferase upon a fructose/fructose-containing polymer by teaching the reaction of inulinase upon inulin to produce DFA III (Derwent- English abstract, line 1).

Saito (V") teaches mass production of DFA III from a variety of DFA III-producing organisms (table 1). Saito also teaches the benefit of purifying inulin from chicory (§1) and purifying DFA III with microorganisms producing inulase II (EC 2.4.1.93) including *Arthrobacter* sp H65-7, wherein DFA III is produced in a yield (purity) of 93% (page 1323, ¶(1); table 2). The purified composition is further purified, including by depleting the composition of fructose and linear oligosaccharides by yeast treatment (1323, §(1), ¶3).

Armarego (U') teaches that "purity is a matter of degree" and that absolute purity is an unattainable ideal (page 1, ¶1). Armarego teaches that carbon (charcoal/decolorizing carbon) is useful in the removal extraneous/contaminant material for solutions by the addition of a small amount of carbon to a solution, then filtered, and that a "greater degree of purity is also to be expected if the [crystallization] process is repeated several times" (page 12, "Recrystallization: Techniques", ¶2). Armarego further teaches that purification by filtration may be supplemented with filter aids, including the diatomaceous earth/silicates "CELITE, FLORISIL, or HYFLO-SUPERCEL" or substituted with various porosity filters (filter paper, glass fibre, sintered glass, NYLON, TEFLON, polyvinyl chloride filters, etc.) or centrifuged depending on the solvent and the nature of compounds in solution/suspension (e.g. particle size, (in)solubility)(page 13). Still further, Armarego teaches that purification of complex organic mixtures includes adsorption chromatography, wherein the adsorbents include "charcoal (usually mixed with kieselgurh or other form of diatomaceous earth, for example, the filter aid CELITE)" (e.g. "Graded Adsorbents and Solvents", page 18).

NDWC teaches that at the time of the instant invention, that granulated activated carbon (GAC) and powdered activated carbon (PAC) were known to the person of ordinary skill in the art including PAC being known and useful for taste and odor control. NDWC further beneficially teaches that GAC and PAC "have been used widely" and that PAC is added to solutions (contacted) and then settled/sedimented (solid:liquid phase separated) (see entire document, e.g. page 2).

Armenante teaches that powdered activated carbon (PAC) was known to have a size in the order of $10^1 \mu\text{m}$ particle size (less than $74 \mu\text{m}$ (< 200 mesh))(see entire document, e.g. page

16). Armenante also teaches the benefits of PAC (versus GAC or other carbons or adsorbants), including PAC material inherently effecting (i) a maximized surface area for mass transfer (adsorption of the aqueous phase/liquid phase adsorbate to the activated carbon (solid phase); separating solid and liquid phases), (ii) minimized agitation to suspend the activated carbon, and (iii) in general is less expensive than larger particle size carbon (see e.g. slides 15 and 51).

USACE teaches that powdered activated carbon (PAC) was known at the time of the instant invention to be obtained by crushing or grinding activated carbon into fine particles wherein PAC (according to ASTM D5158) consists of a particle size $\leq 177 \mu\text{m}$ (80 mesh) and wherein GAC (according to AWWA) consist of particles size $\geq 297 \mu\text{m}$ (retained on a 50-mesh sieve) (see entire document, e.g. chapter 2, page 2-1)).

Tanaka differs from the instant claims in that Tanaka appears to be silent with respect to the percentage purity and brix of the starting material and product; the quantity and quality (particle size/surface area/mesh) of carbon adsorbent used; and the sequence of contacting of the solid, liquid, and carbon.

Uchiyama differs from the instant claim in that Uchiyama appears to be silent with respect to the claimed percentages, amounts, and dimensions of the carbon and DFA compositions.

Tomita differs from the instant claims in that Tomita appears to be silent with respect to the claimed purity of DFA, percentage of carbon.

It would have been obvious to a person of ordinary skill in the art at the time the instant invention was made to have provided any active carbon source or any DFA III and to purify the composition to the desired purity (e.g. 70%(w/w)) in the methods of Tanaka/Uchiyama/Tomita, because Saito teaches that DFA III isolated from a variety of sources was known at the time of the invention; because Armarego teaches that purity is merely a matter of degree whereby a variety of techniques are well-established and routinely optimized for the purpose of purification, including filtration/adsorption with silicates (e.g. diatomaceous/Fuller's earth), silica, activated carbon, etc.; further because NDWC and Armenante teach that powdered activate carbon were known and useful in adsorption-purifying of compositions and because USACE teaches that PAC and GAC intrinsically comprise the same chemical material, activated carbon.

One would have been motivated to purify the compositions with active carbon including PAC, because Tanaka/Uchiyama teach in general that DFA may be purified using active carbon and HIGH-FLOW SUPERCELL/CELITE and because Armenante teaches that providing PAC to an adsorption-purification (versus larger particle size carbon) effects maximizing mass transfer surface area; minimizing agitation to suspend the activated carbon; and provides a lessened expense in the process (see e.g. slides 15 and 51).

The quality (purity, brix) of the DFA of Tanaka appears to be an obvious variant of that instantly claimed in that the compositions appear to have the same chemical core, obtained from the same composition (and/or commercially available materials), and would thus be expected to have similar chromatographic selectivity properties, especially as said purification relates not to the DFA but to the adsorption of the impurities therewith. Additionally, the carbon of the prior art is deemed to be an obvious variant of the instantly claimed activated carbon in that both

materials comprise active carbon and are useful for the same purpose intrinsic to activated carbon (adsorption, purification, decolorizing, deodorizing, etc.).

Armarego is relied upon for the reasons discussed above for the general benefit of purification, including adsorption with activated carbon. If not expressly taught by Armarego, based upon the overall beneficial teaching provided by this reference and by the teachings of NDWC, Armenante, and/or USACE with respect to purification including purification with activated carbon and/or PAC in the manner disclosed therein, then the adjustments of particular conventional working conditions (e.g., determining one or more suitable particle size ranges in which to perform such a purification/adsorption), is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan, and accordingly the skilled artisan seeking to adsorb a compound with carbon would recognize that increasing surface area (e.g. granular/powder/15-200 micron granules) would increase contact/absorption/mass transfer of molecules upon the PAC particles.

Thus the contacting of each of the starting material DFA and the carbon of the size, purity, and quantity disclosed or obvious to provide therein would still be expected to interact in the manner claimed (increasing the purity of the composition), especially in the absence of criticality or objective evidence to the contrary.

One would have had a reasonable expectation of success in making a purified DFA III composition, because the success depends upon contacting a DFA composition of known core structure, with a powdered activated carbon of known activity, in a known method (contacting/adsorbing), to yield a predictable result (increased purity/ removal of adsorbed impurities) and well within the purview of the skilled artisan.

Tanaka and Saito are relied upon for the reasons discussed above. If not expressly taught by Tanaka/Saito, based upon the overall beneficial teaching provided by the references with respect culturing an aerobic bacteria, extent of purification of reagents/products, and proportions of ingredients in the manner disclosed therein, the adjustments of particular conventional working conditions (e.g., determining one or more suitable concentration ranges (e.g. aerobic culturing oxygenation/aeration; quantities, qualities, and proportions of composition components in which to perform such a purification), is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.

Furthermore, selection of any order of mixing ingredient is *prima facie* obvious in the absence of new or unexpected results (see, e.g., *In re Gibson*, 5 USPQ 230 - CCPA 1930). MPEP § 2144.04. Also, Selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results (see, e.g., *Ex parte Rubin*, 128 USPQ 440, 1959, and *In re Burhans*, 154 F.2d 690, 69 USPQ 330 - CCPA 1946) MPEP § 2144.04.

Please note, claims 50-52 have been included in this rejection since the treating of inulin does not require an isolated, purified, or other manipulation which would distinguish an inulin conversion by an organism containing the enzyme from inulin conversion by an (inulin) fructosyltransferase enzyme *per se*.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35 USC 103(a).

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Response to Arguments

Applicant's arguments filed August 30, 2010, are acknowledged. Applicant has that the prior art of record does not teach providing or optimization of powdered activated carbon having the claimed particle size and has also argued that the instant invention provides superior results versus granulated activated carbon (GAC) or other adsorbants .

In response to Applicant's arguments that it was not recognized at the time of the instant invention that contacting prior to solid-liquid separation and selecting size of active carbon particles within the range required by the claims are result-effective variables; this is not found to be persuasive for the reasons of record and as further argued in view of NDWC, Armenante, and USACE which beneficially teach using powdered activated carbon (PAC) (versus granulated activated carbon (GAC) and/or other adsorbants) were well known and routinely optimized at the time of the instant invention, including for example as argued above, providing PAC to increase mass transfer or decreasing costs of the adsorption process.

Applicant has also argued that the results are superior; however, for the reasons of record (in the final rejection of 12/30/2009) the statistical and practical significance (probative value) of the results; and the nexus of the presented results to the superior/unexpected results stand as not persuasive over the arguments of record.

Furthermore, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., smell, odor, color and resolution among gradations thereof) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In the instant case claims 43-47 and 50-65 do not recite a smell, odor, or color and further the objective features which delineate between colored and odorous compounds and degrees thereof, are not recited in the claims and thus not determined except by the subjective determination of the artisan practicing the invention. Accordingly, Applicant's arguments are/remain insufficient to overcome the rejections of record.

In response to Applicant's arguments that the prior art does not teach contacting prior to solid-liquid separation, this is not persuasive, because Applicant has not argued and has not provided evidence that the *sequence* of providing the powdered activated carbon (PAC) provides for some unexpected result, and thus for the reasons of record (i) the selection of any order of mixing ingredient is *prima facie* obvious in the absence of new or unexpected results and (ii) the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results (see MPEP § 2144.04).

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the foregoing discussion, the Examiner concludes that the subject matter defined by the instant claims would have been obvious within the meaning of 35 USC 103(a).

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

No claims are allowed.

Allowable Subject Matter

Claim 56 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON J. KOSAR whose telephone number is (571)270-3054. The examiner can normally be reached on Monday-Thursday, 7:30AM-5:00PM, ALT. Friday, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron J Kosar/
Examiner, Art Unit 1651

/Christopher R. Tate/
Primary Examiner, Art Unit 1655